



Sustainability AT ILLINOIS

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Thinking Globally and Acting Locally: A Sustainability Vision for Higher Education

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Fellow for Sustainability



Acknowledgments

- Hundreds of faculty, staff, and students from across Illinois contributed to this vision.
- The ideas of the following individuals were particularly influential in shaping the vision:
 - Brian Anderson
 - Suhail Barot
 - Val Beasley
 - Hans Blaschek
 - Brian Deal
 - Gale Fulton
 - Praveen Kumar
 - Robert McKim
 - Jesse Ribot
 - Bill Stewart
 - Madhu Viswanathan
 - Michelle Wander
 - Dick Warner
 - Carl Wegel



Illinois Sustainability Initiative

- 2007 Strategic Plan
- 2008 Chancellor launched:
 - Sustainability Council to provide strategic direction & oversight of the initiative
 - Office of Sustainability to provide operational leadership for the initiative
- 2008-09: Sustainability vision created through participatory cross-campus process
- 2009-10: Launch implementation of the vision through adaptive cross-campus engagement



Objective of the Illinois Sustainability Vision

- Become a world leader in creating new knowledge and innovative solutions to the following grand challenges:
 1. *Maintaining or restoring critical ecosystem function while providing essential human services; and*
 2. *Sustainably raising quality of life for the poor to acceptable levels.*
- To do so, we will infuse sustainability programs across campus to foster a level of cross-disciplinary engagement comparable to a unit or center.



Goals of the Illinois Sustainability Vision

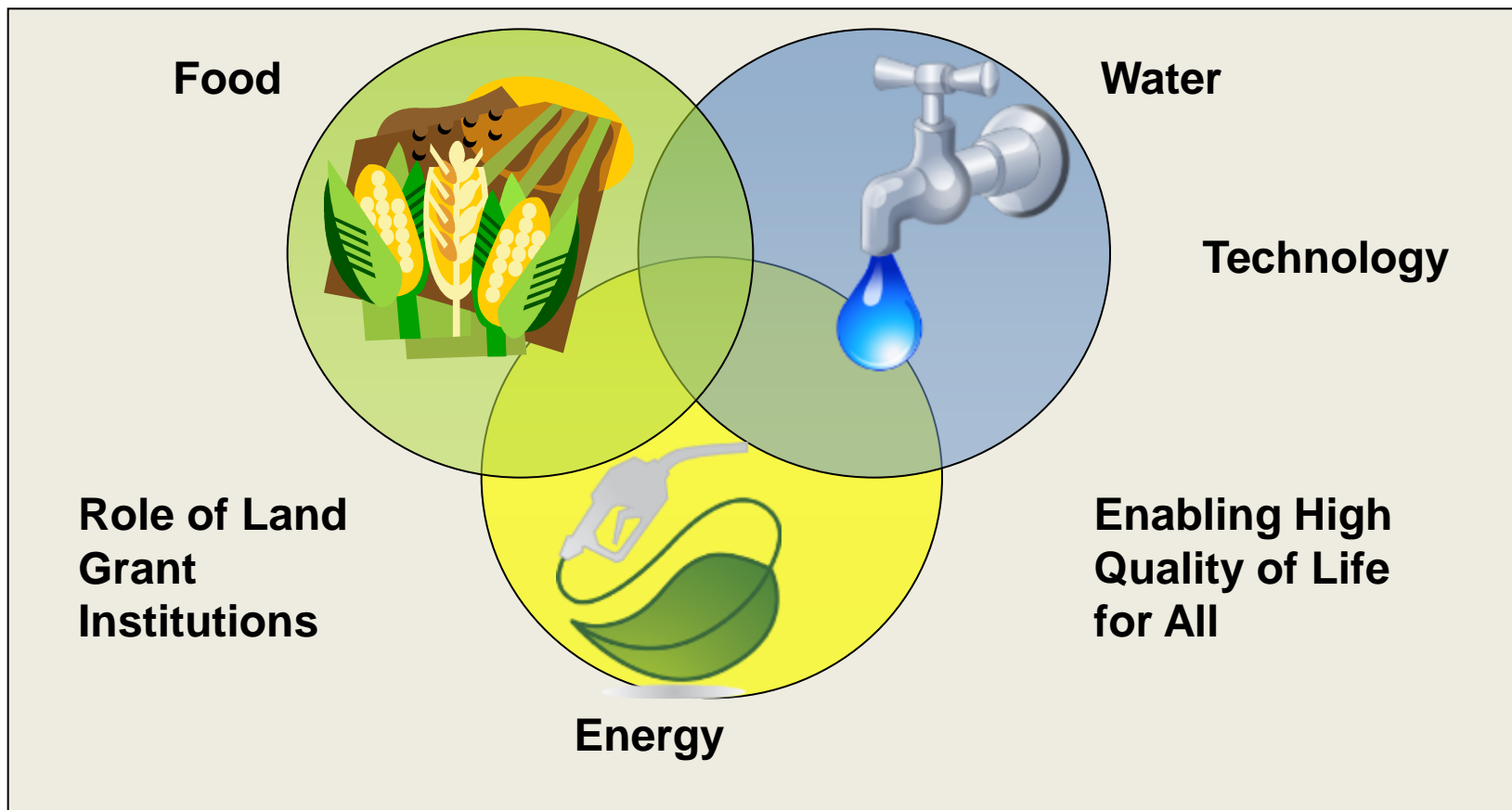
1. Create a new forum for in-depth, cross-disciplinary engagement on the sustainability grand challenges.
2. Create and implement a sustainable campus operations plan that maintains or restores natural ecosystem function and supports impoverished communities.
3. Infuse sustainable thinking into campus missions through new education activities.
4. Create incentive programs that spur sustainability activities to meet the above goals.
5. Create a viable financial plan for sustainability activities.



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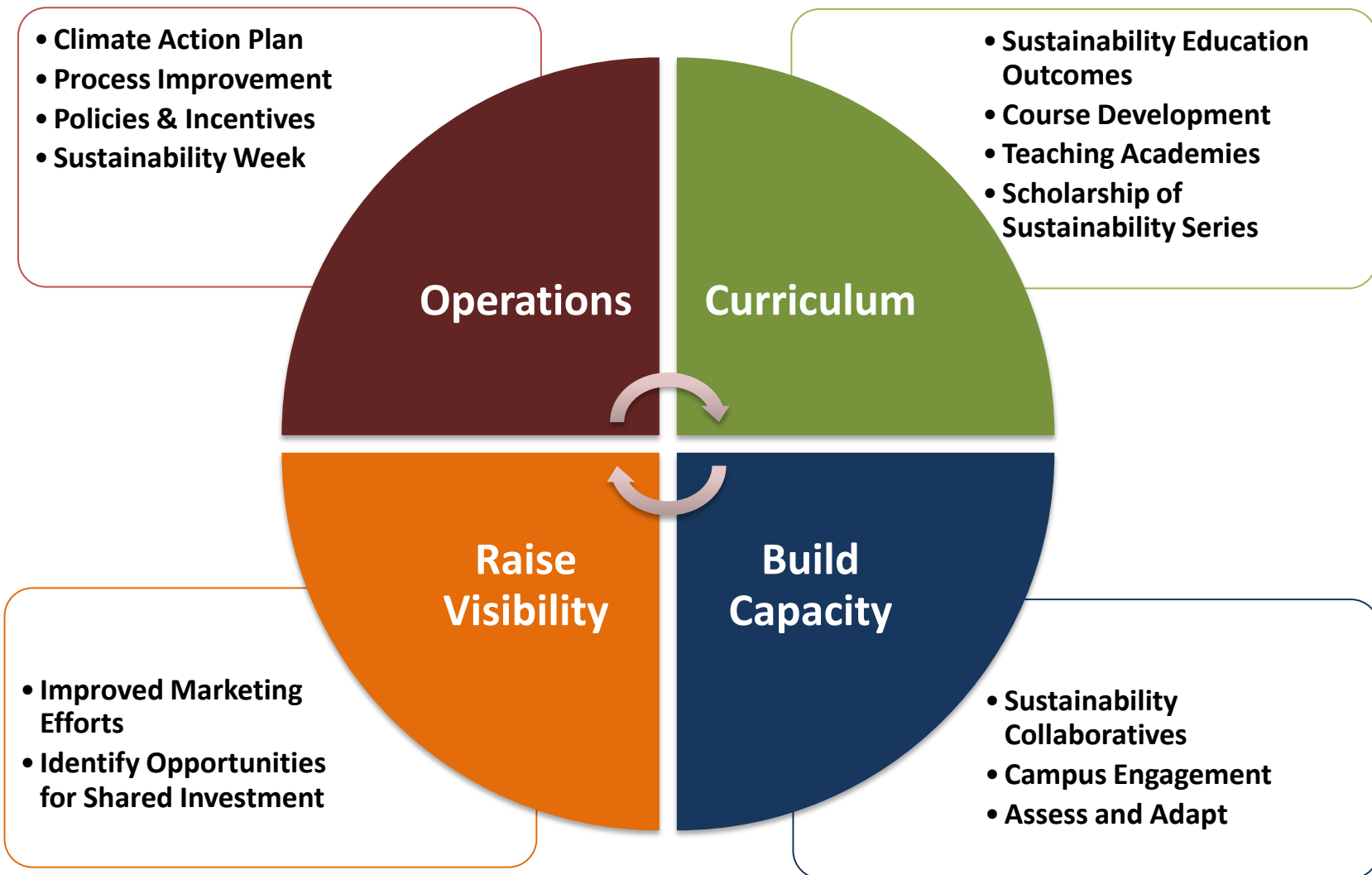
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Illinois Sustainability Theme





2010-11 Illinois Sustainability Implementation Plan





Keynote Activities

- Scholarship of Sustainability Series
 - Spring 2010 offering engaged hundreds of students, faculty, staff, & community members
 - Second offering planned for Spring 2011
- Illinois Climate Action Plan (iCAP)
 - Chancellor signed in May 2010 – 1st Big Ten Institution
 - Implementation underway



Keynote Activities (Cont'd.)

- Sustainability Collaborative
 - White paper created, marketing & proposals underway
- Prairie Project: Infusing Sustainability Across the Curriculum
 - First cohort of 15 faculty will reach 4,000 students this year
 - Second offering planned in May 2011
- Sustainability Week (October 25-30, 2010)



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How Do We Measure Progress, & Ultimately Success?



University Rating Systems

STARS 1.0 Credit Checklist

Category 1: Education & Research (ER)		
Credit Number	Credit Title	Possible Points
Co-Curricular Education		
ER Credit 1	Student Sustainability Educators Program	5
ER Credit 2	Student Sustainability Outreach Campaign	5
ER Credit 3	Sustainability in New Student Orientation*	2
ER Credit 4	Sustainability Materials and Publications	4
<i>Tier Two</i>	<i>Co-Curricular Education Tier Two Credits</i>	2
Curriculum		
ER Credit 5	Sustainability Course Identification	3
ER Credit 6	Sustainability-Focused Courses	10
ER Credit 7	Sustainability-Related Courses	10
ER Credit 8	Sustainability Courses by Department*	7
ER Credit 9	Sustainability Learning Outcomes*	10
ER Credit 10	Undergraduate Program in Sustainability*	4
ER Credit 11	Graduate Program in Sustainability*	4
ER Credit 12	Sustainability Immersive Experience*	2
ER Credit 13	Sustainability Literacy Assessment	2
ER Credit 14	Incentives for Developing Sustainability Courses	3
Research		
ER Credit 15	Sustainability Research Identification*	3
ER Credit 16	Faculty Involved in Sustainability Research*	10
ER Credit 17	Departments Involved in Sustainability Research*	6
ER Credit 18	Sustainability Research Incentives*	6
ER Credit 19	Interdisciplinary Research in Tenure and Promotion*	2
Total		100

AASHE STARS
Rating System
(<http://aashe.org>)



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Climate Action

iCAP

A Climate Action Plan

for the
University of Illinois at Urbana-Champaign

MAY 15, 2010

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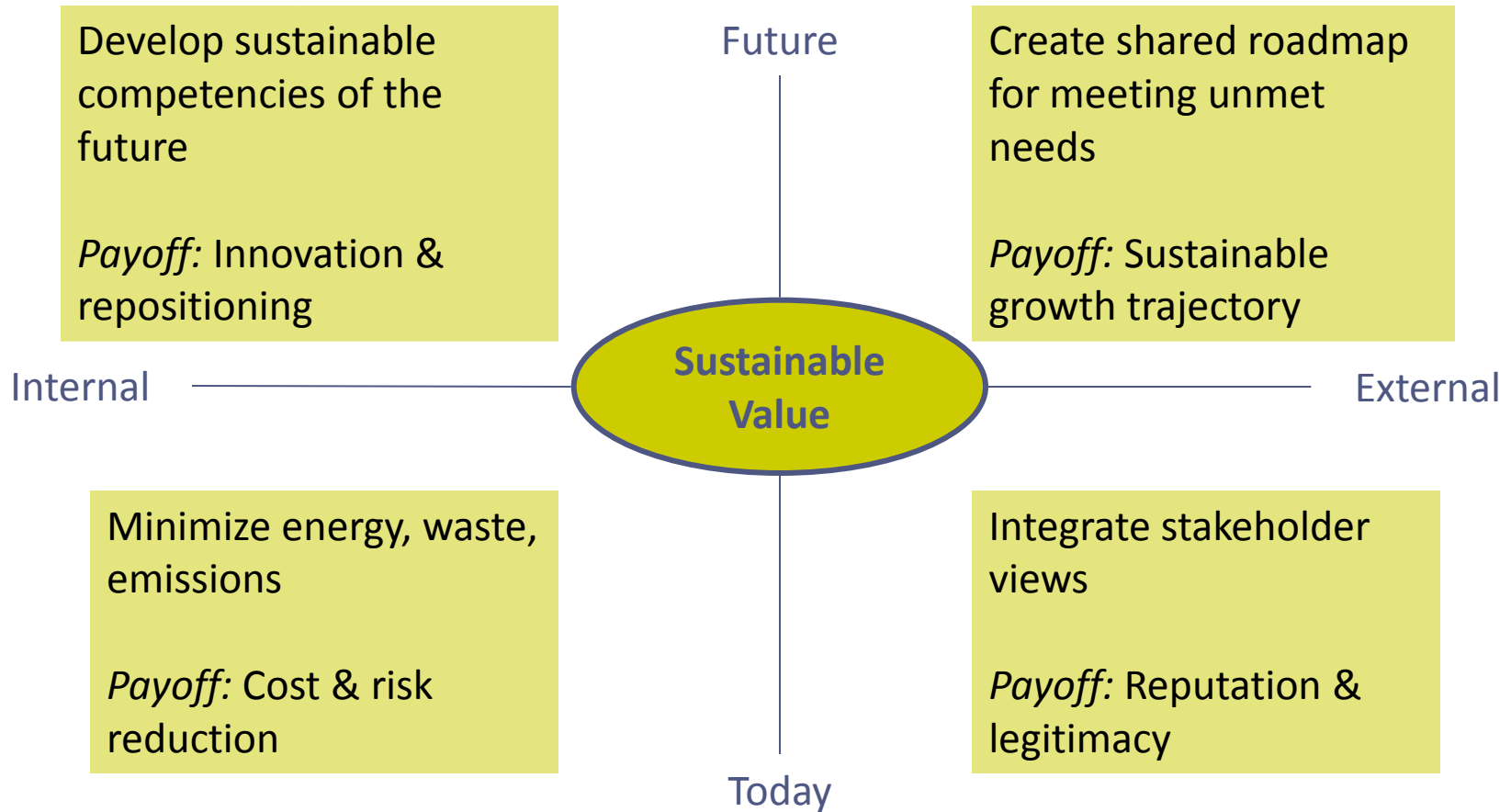


iCAP Targets Related to Food, Water, Energy Theme

- **Energy Conservation.** 30 percent reduction in total building energy use 2020, 30 percent reduction in associated building related emissions.
- **Renewable Energy.** Satisfy at least 5 percent of electrical energy needs through renewable energy generation systems by 2015, and 25 percent by 2025
- **Procurement and Waste.** 30 percent of food purchases from local sources (within 100 miles) by 2015. Zero Waste campus policy by 2012, large-scale food composting project by 2012, and increase waste diversion rate to 75 percent by 2020.
- **Water.** Potable water reduction target of 20 percent by 2015. Connecting existing raw water system by 2020 for non-potable water.



Creating Sustainable Value





Where Is Industry Going?

- Walmart announced Sustainability Index in 2009
 - <http://walmartstores.com/Video/default.aspx?id=1379>
- Over \$146 billion are spent each year by U.S. colleges and universities for goods and services (ULSF, The Declaration Vol.1, 1996)
 - Greater than the GDP of all but 20 countries in the world.



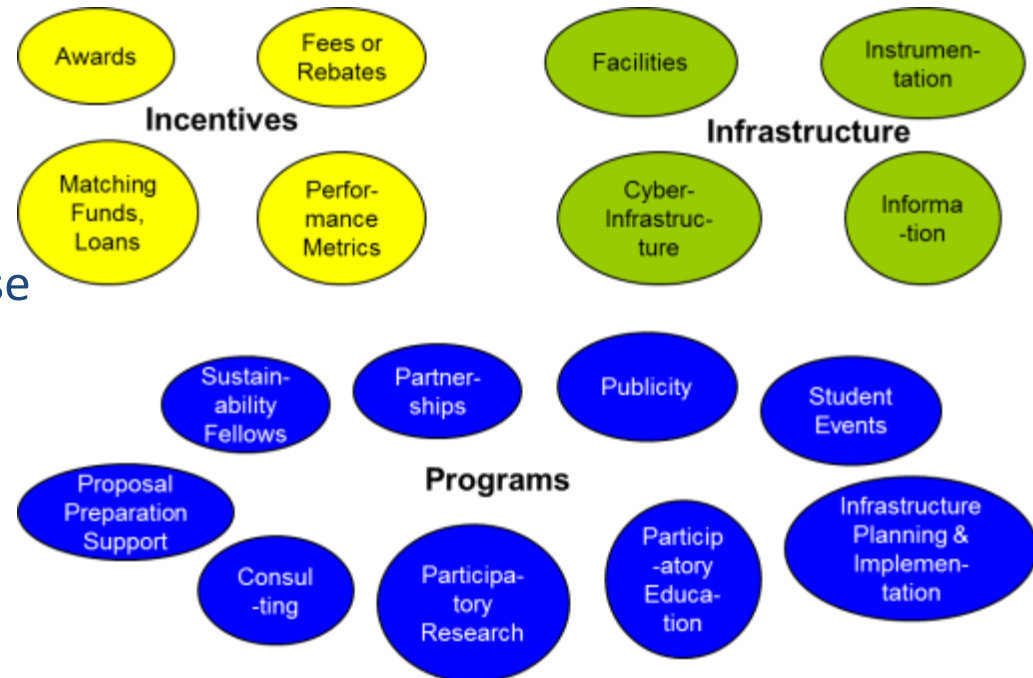
The Opportunity: Create a Sustainability Collaborative

- Through community-based education, research, and innovation, a global network of universities will promote:
 - a high quality of life (social & economic) for **all** people, **and**
 - healthy and diverse ecosystems that are resilient to disruptions.



What Will the Illinois Collaborative Be?

- Illinois campus & its:
 - Watersheds
 - Foodsheds
 - EnergyshedsIncluding social-, economic-, & eco-systems within those boundaries
- Units & individuals could join
- Incentives, infrastructure & programs





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Examples of Potential Sustainability Collaborative Infrastructure & Partnerships

Tongji University, China, Sustainability Activities



Low-carbon city



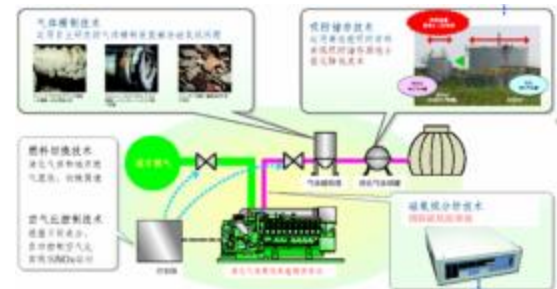
Biomass Energy



BIPV



Building Integrated PV



New Energy

Simulation Technology based Urban Planning



- New Energy
- New Materials
- New Equipment
- New System
- New Solution

Wind & Thermal Environment Simulation

Urban/Building Energy Management System



Building Energy Management

Fluxes:

N_2O
 CH_4
 CO_2



Photos:
phenology



Fluxes:

CO_2
 H_2O
 S



Meteorology:

wind

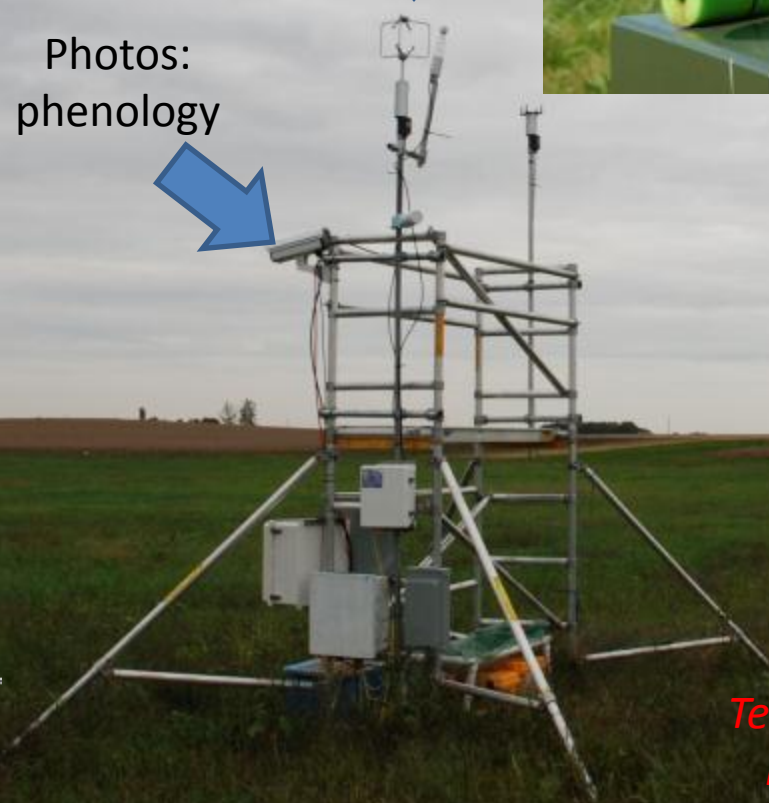
Air Temperature

Net radiation

Humidity

Canopy Temp

PAR



Soil:

Heat flux

Temperature (to 1 m)

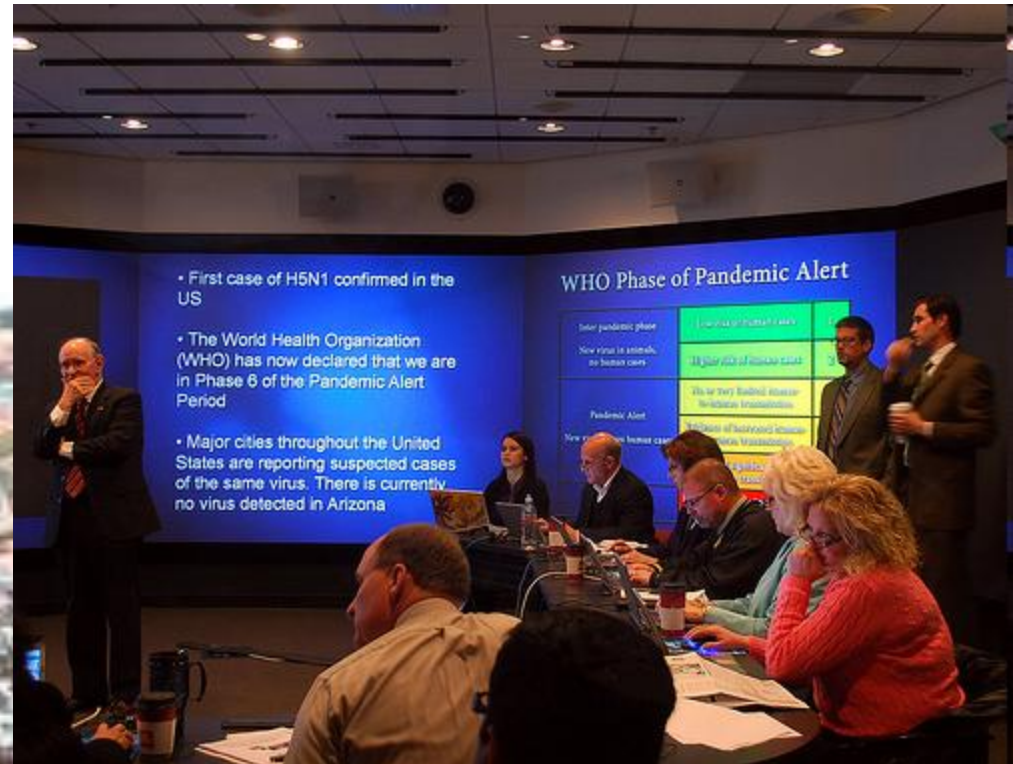
Moisture (to 1 m)

Source: Energy
Biosciences Institute

Instrumented field drains



Survey Infrastructure & Decision Theater

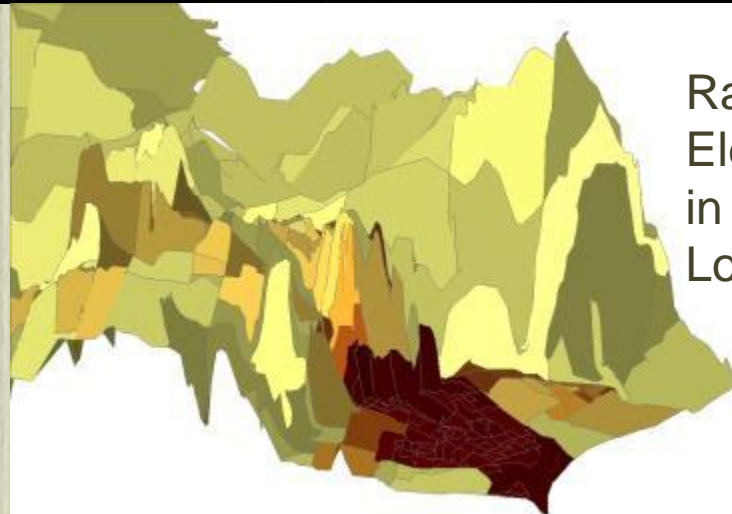


Source: Arizona State U

RiverWeb



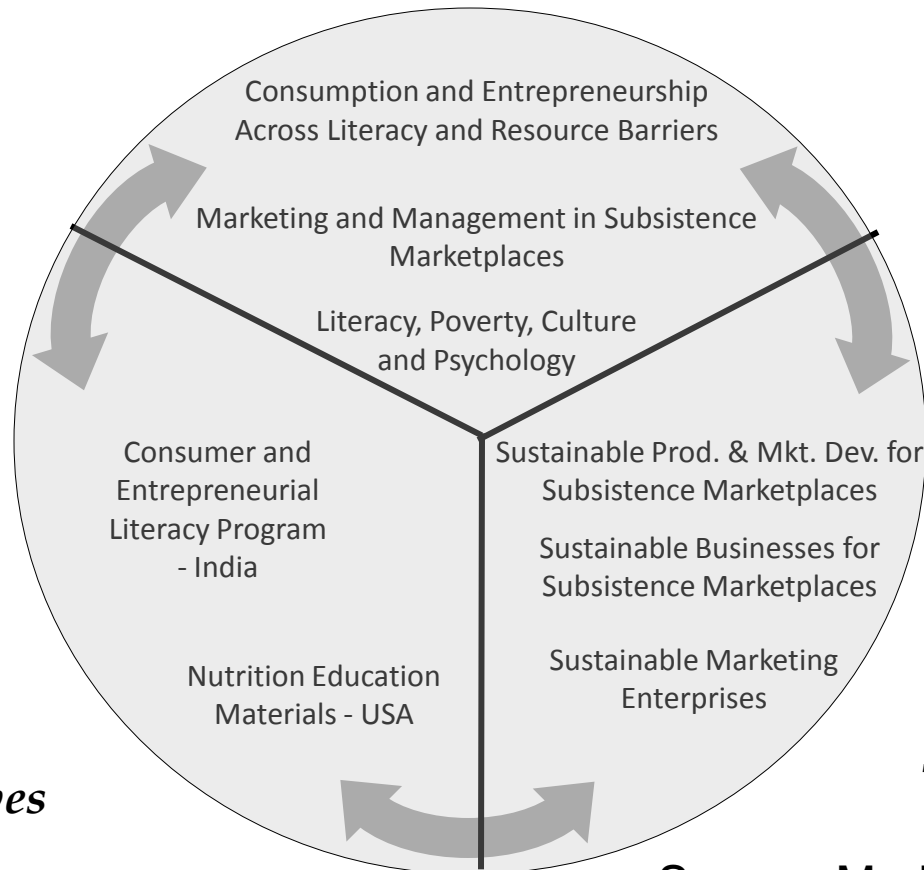
RiverWeb



Race vs
Elevation
in E. St.
Louis

Partnerships With Communities in Our Supply Chain

Research



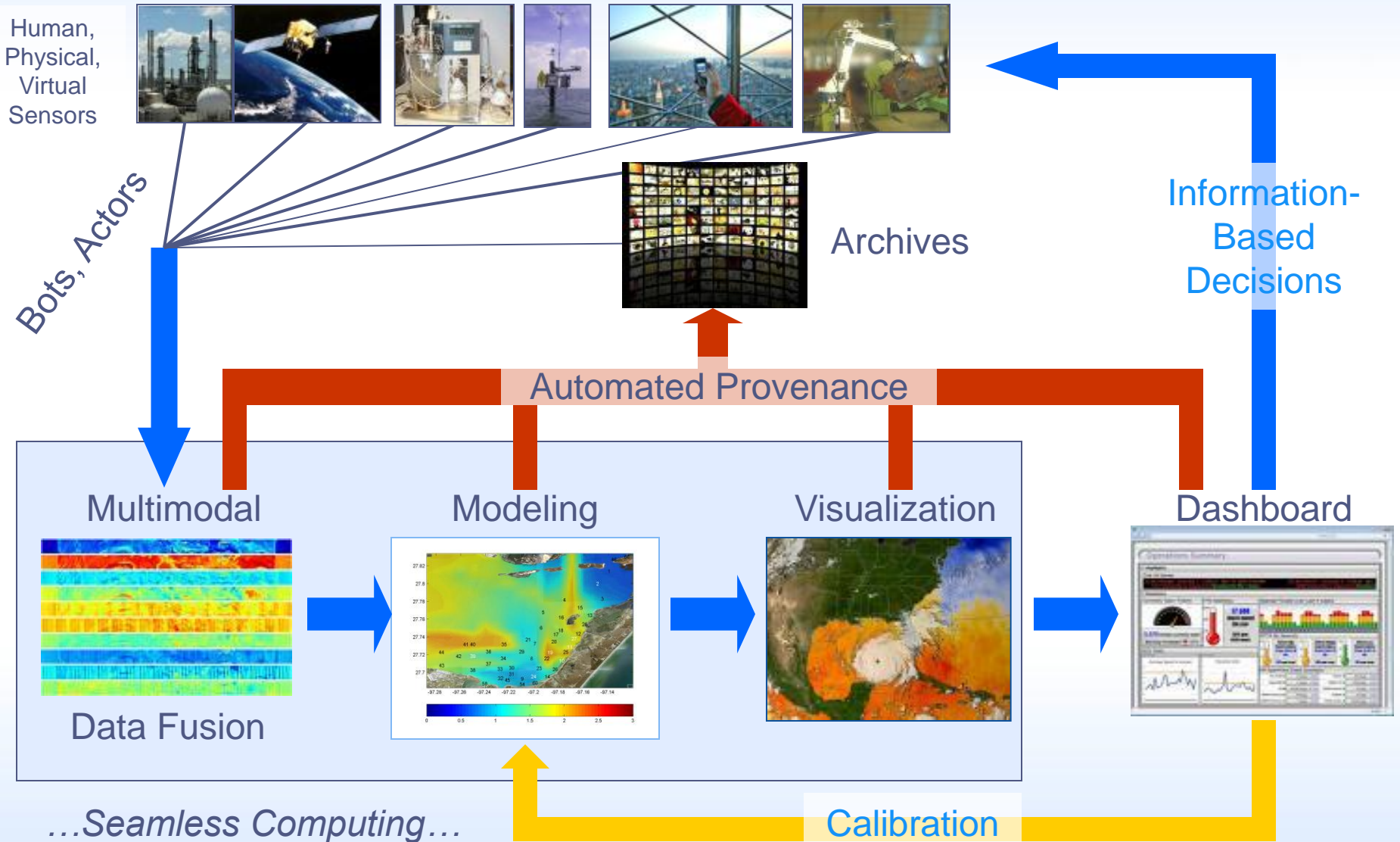
Teaching

Social Initiatives



Source: Madhu Viswanathan

Integrated, Information-Based Decision Making

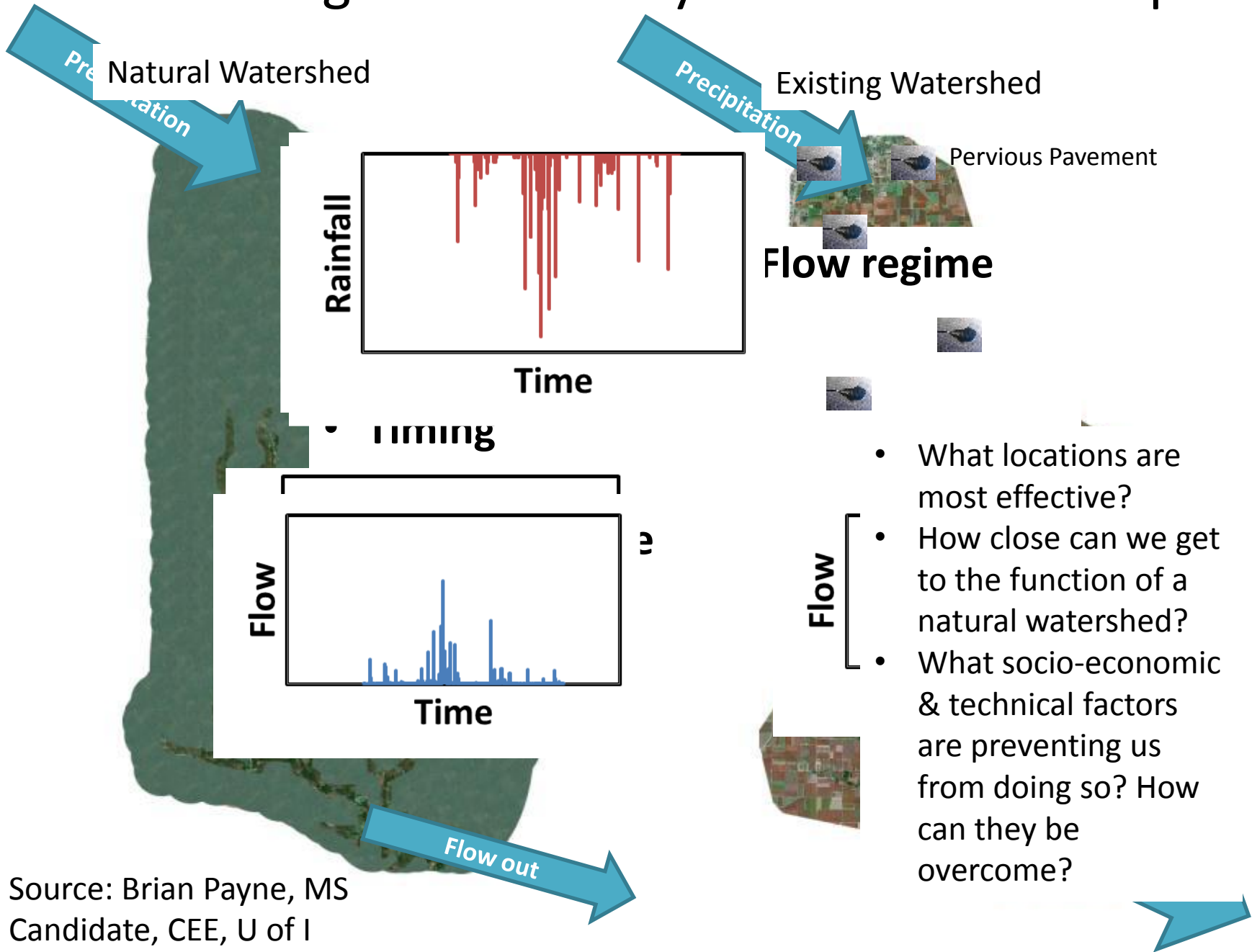




Holistic Sustainability Metrics

- Goal: Emulate natural ecosystems as closely as possible
 - Closed loops - waste from one process is re-used or becomes input to another process, with no waste accumulating in the environment
 - Re-use non-renewable resources (e.g., minerals, soil)
 - Use renewable resources (e.g., water and forestry supplies) at rate less than renewal rates
 - Provide habitats to healthy and diverse populations of native species
- Measure where greatest impacts are (local, regional, & global through supply chain partnerships), focus learning & investments there

Measuring Sustainability: Watershed Example





Conclusions

- Creating strategic value through sustainability activities is essential to success
- Strategic value for sustainability requires:
 - Holistic metrics
 - Infrastructure and partnerships with suppliers & communities to assess & improve metrics
 - Research, education, & engagement to understand & overcome barriers
- Sustainability collaborative is a structure for colleges & universities to collaborate in creating strategic value
 - How can we make it happen in times of tight budgets?